

Memorandum

TO: HONORABLE MAYOR AND
CITY COUNCIL

FROM: Kerrie Romanow

SUBJECT: SEE BELOW

DATE: August 26, 2013

Approved



Date

9/9/13

SUBJECT: AGREEMENT WITH BROWN AND CALDWELL FOR ENGINEERING SERVICES FOR THE DIGESTER AND THICKENER FACILITIES UPGRADE PROJECT AT THE SAN JOSÉ-SANTA CLARA REGIONAL WASTEWATER FACILITY

RECOMMENDATION

Approval of a consultant agreement with Brown and Caldwell to provide engineering services for the Digester and Thickener Facilities Upgrade Project at the San José-Santa Clara Regional Wastewater Facility (formerly known as the San José/Santa Clara Water Pollution Control Plant). This agreement will be effective from the date of execution to December 31, 2019, for a total amount not to exceed \$12,017,526.

OUTCOME

Approval of this recommendation provides the City with professional engineering services needed for the design of the Digester and Thickener Facilities Upgrade Project at the San José-Santa Clara Regional Wastewater Facility (Facility). The first phase of the Digester and Thickener Facilities Upgrade Project (Project) will rehabilitate four digesters, including new covers and mixing systems; heating system and gas collection and conveyance system upgrades; structural and seismic retrofits; electrical, instrumentation and control systems upgrades; and Dissolved Air Flotation Thickeners (DAFTs) modifications to allow for sludge co-thickening including new odor control treatment. Completion of this project will refurbish Digesters 5, 6, 7 and 8 to allow them to be put back in service for the next 20 years; replace the inefficient gas mixing and heating systems resulting in improved digester gas production; and, bring the gas conveyance system into compliance with current National Fire Protection Association (NFPA) and National Electrical Code (NEC) standards.

EXECUTIVE SUMMARY

City staff recommends approval of an agreement with Brown and Caldwell for a total amount not to exceed \$12,017,526 to provide professional engineering services for the Digester and

Thickener Facilities Upgrade Project, which will upgrade four digesters, upgrade the digester gas pipeline, and retrofit the existing DAFT to operate as a co-thickening facility.

BACKGROUND

Description of Existing Digestion System

The Facility has 16 anaerobic digesters of varying ages constructed between 1956 and 1983. Of the sixteen digesters installed, six are currently out of service due to structural damage or other mechanical failures. The remaining ten digesters are operational (though all are nearing the end of their useful life), with a minimum of eight and up to ten being operated at any given time. The digesters receive primary sludge (i.e., solids) from the primary clarifiers and thickened waste activated sludge from the DAFTs. Sludge is retained in the digester tanks for up to 30 days to allow the digestion process to reduce volatile solids and destroy pathogens. The digested sludge is then pumped and stored in open air storage lagoons (a 3-year process) and drying beds (a 6-month process) for further stabilization and conversion to high quality Class A biosolids. The dried biosolids are eventually trucked to the nearby Newby Island landfill for use as alternate daily cover.

A by-product of the biological digestion process is digester gas (i.e. methane gas) which is captured for re-use to help meet the Facility's energy needs. Digester gas is conveyed via a main manifold to two existing gas holders, waste gas flares, and a compressor facility. Most of the produced gas is compressed and blended with natural gas (or landfill gas, if available) and used as fuel for the Facility's cogeneration engines and engine-driven blowers. Any excess gas is burned by the waste gas flares.

History of the Digester and Thickener Upgrade Project

An Infrastructure Condition Assessment (ICA) report completed in 2007 by CH2M Hill identified a number of potential improvements to the anaerobic digesters and gas conveyance and collection systems. Rehabilitation of the anaerobic digesters and digester gas systems was identified as high priority project ranking in the top ten amongst the 70 potential capital improvement projects identified by the ICA report. The report further recommended that high priority projects be implemented within a 5-to-10 year period.

Following on the ICA report recommendations, a detailed condition assessment and technology evaluation study was commissioned in July 2010. The study was performed by Brown and Caldwell under City direction. Tasks performed under this effort included performing market research and a business case evaluation for potentially accepting Fats, Oils, and Grease (FOG) at the Facility as well as adding a new sludge co-thickening process; a planning level evaluation of flow and loading rates; a condition assessment of the structural integrity of the existing digesters to accept new covers; a technology review of different types of digester covers and mixing systems; a condition assessment of the digester tunnels and options for bringing them into compliance with current NFPA standards; an evaluation of the existing condition of the existing heating system and pilot testing considerations for operating the digesters at higher temperatures;

a condition assessment of the existing electrical systems; and a review of the existing struvite formation issue at the Facility and mitigation alternatives. The study was completed in June 2011.

The study provided staff with information necessary for City staff decision making and informing the scope of the Project for design advertisement. Key decisions resulting from the detailed condition assessment and technology evaluation study included:

- Selection of Digesters 5, 6, 7 and 8 for rehabilitation
- Selection of submerged fixed concrete covers
- Identification of four different mixing system technologies two of which have been selected for further verification during detailed design
- Identification of two different options for bringing the digester tunnels and gas piping into compliance with current codes; one option will be selected during detailed design
- Proceeding with additional detailed evaluation and testing of the heating system capacities to confirm the capability of operating the digesters at a higher temperature for production of Class A biosolids; this work is to be completed as an early activity during detailed design
- Confirmation of the existing condition of electrical and instrumentation/control system to be further developed during detailed design
- Proceeding with in-house bench scale testing of ferric chloride for struvite control
- Proceeding with sludge co-thickening in the DAFTs

Detailed Project Description

The project scope includes upgrades to four existing anaerobic digesters (Digesters 5, 6, 7 and 8), upgrades to the digester gas pipeline, and retrofits to the existing DAFT to operate as a co-thickening facility.

All elements associated with the digesters will be upgraded, including covers, mixing and heating systems, electrical and instrumentation components, and associated equipment. All existing digester gas piping, associated appurtenances, and instrumentation will be upgraded to meet future gas production needs, including the potential addition of alternative feed sources to the digesters (i.e., fat, oil and grease or food waste). The upgraded pipe will be designed in accordance with current standards and regulations, addressing current reliability and safety issues at the Facility.

The City is also in the process of replacing one of the digester gas holders and upgrading the gas compressor facility due to mechanical failures. The new digester gas piping will be connected to these new facilities and provisions will be made to ensure an integrated operation of the whole system. Upgrades to the DAFT units will allow for co-thickening of combined primary and waste activated sludge. Improvements will include modifications to existing piping, tanks, associated equipment, and electrical and instrumentation components to allow for the new operation scheme. The upgraded tanks will be provided with covers and odor control system.

August 26, 2013

Subject: Agreement for the Digester and Thickener Facilities Upgrade Project

Page 4 of 7

ANALYSIS

The City issued a Request for Qualifications (RFQ) on February 25, 2013 seeking engineering design, construction support, testing and commission services for the Digester and Thickener Facilities Upgrade Project.

A pre-proposal site tour was completed on March 5, 2013, with a total of 30 people in attendance. Brown and Caldwell was the sole proposer submitting a Statement of Qualifications by the March 18, 2013 submittal deadline. Although this procurement was discussed at an outreach workshop in November 2012 where more than 100 consultants, contractors and suppliers were in attendance; the lower than expected response can be attributed to some firms choosing to instead submit for the Program Management Services RFQ which was advertised on March 28, 2013. Any firm selected to for the digester rehabilitation project would have been conflicted out of the Program Management Services RFQ.

A panel consisting of representatives from the Environmental Services Department Engineering and Operations and Maintenance divisions evaluated the Statement of Qualification. The panel determined that Brown and Caldwell met the minimum qualifications and experience requirements set forth in the RFQ. Staff has confirmed through discussions with the City Attorney's Office that Brown and Caldwell's preparation of the condition assessment and technology evaluation study completed in June 2011 (which study was included as a part of the RFQ issued on February 25, 2013) does not appear to present any disqualifying conflict of interest or unfair competitive advantage.

Evaluation of the Statement of Qualifications was based on the following criteria:

- Proposal Responsiveness
- Experience
- Expertise
- Project Understanding & Approach
- City's Local and Small Business Preference Policy

Brown and Caldwell is nationally recognized for their expertise and experience in the anaerobic digestion and biosolids processing field. As part of their proposal, Brown and Caldwell presented the City with an abundance of projects similar in size and scope to the planned Facility project that confirmed their extensive design experience in anaerobic digestion and DAFT upgrades.

Brown and Caldwell is currently the designer for the digester upgrades for East Bay Municipal Utilities District (EBMUD) and City and County of San Francisco Public Utilities Commission (SFPUC). In particular, the EBMUD digester rehabilitation project is similar in scope and magnitude to the project envisioned for the Facility, with both plants' original digesters designed by the same consultant and constructed at the same time. Brown and Caldwell has already completed the design and construction of EBMUD's project, bringing an understanding of potential issues that could be encountered and previous experience that could provide possible savings in time and money to the City.

August 26, 2013

Subject: Agreement for the Digester and Thickener Facilities Upgrade Project

Page 5 of 7

Staff, along with the Executive Program Advisor, conducted extensive negotiations with Brown & Caldwell to arrive at a level of effort estimate and fee structure for the project. The final negotiated fee reflects a reduction of over \$1.2 million from the consultant's proposal. Professional services to be provided under this contract include project administration, preliminary engineering and design development, and support services during bidding, construction, start up and commissioning phases.

The total negotiated fee (not including optional services) represents 19.5% of the estimated project construction cost of \$50 million. In addition to design, bidding and construction support services, the negotiated fee includes commissioning and training support services to ensure optimal functioning of the equipment and systems. In addition, optional services in the amount of \$2,236,429 (or 4.5% of estimated construction costs) may be exercised at City's sole discretion for City directed design modifications, detailed instrumentation and control wiring drawings, and any other additional services that may be required. Staff benchmarked the negotiated fees with other similar projects and found the negotiated fee to be reasonable for a project of this size and complexity.

Staff also anticipates bringing forward a recommendation for program management services to Council in September 2013. The program management firm will provide third party design and constructability reviews and cost validation for this project and will ensure coordination of this project with the overall CIP program.

In summary, compensation for the consultant's services will be for a total agreement amount not-to-exceed \$12,017,526. This amount includes \$2,236,429 in optional services to be authorized by the Environmental Services Department Director at the City's sole option. The term of agreement will be from the date of execution through December 31, 2019. The project schedule assumes 18 months for design, 6 months for bidding including contractor pre-qualification, 30 months for construction and start-up, and 12 months for post-substantial completion operations training and engineering support.

EVALUATION AND FOLLOW-UP

Progress and performance on delivery of this CIP project will be reported to Council through the semi-annual updates to the Transportation and Environment Committee. In addition, project progress will be reported to the Technical Advisory Committee and the Treatment Plant Advisory Committee through monthly progress reports.

August 26, 2013

Subject: Agreement for the Digester and Thickener Facilities Upgrade Project

Page 6 of 7

POLICY ALTERNATIVES

Alternative # 1: Direct City Staff to provide the required services with in-house resources.

Pros: None.

Cons: A lack of existing capacity and expertise will result in significant delays initiating this project and subsequently create delays to other pending capital projects.

Reason for not recommending: The complexity of implementing a project of this size requires the use of specialized expertise and experience in the anaerobic digestion and biosolids processing field.

PUBLIC OUTREACH

- ✓ **Criterion 1:** Requires Council action on the use of public funds equal to \$1 million or greater. **(Required: Website Posting)**
- ☐ **Criterion 2:** Adoption of a new or revised policy that may have implications for public health, safety, quality of life, or financial/economic vitality of the City. **(Required: E-mail and Website Posting)**
- ☐ **Criterion 3:** Consideration of proposed changes to service delivery, programs, staffing that may have impacts to community services and have been identified by staff, Council or a Community group that requires special outreach. **(Required: E-mail, Website Posting, Community Meetings, Notice in appropriate newspapers)**

This memorandum will be posted on the City's website for the September 24, 2013 City Council Agenda.

COORDINATION

This project and memorandum have been coordinated with Risk Management, Equality Assurance, the City Manager's Budget Office, and the City Attorney's Office. This item is scheduled to be heard at the September 12, 2013 Treatment Plant Advisory Committee meeting.

FISCAL/POLICY ALIGNMENT

This agreement is consistent with the Council-approved Budget Strategy to focus on rehabilitating aging Plant infrastructure, improve efficiency, and reduce operating costs. This agreement is also consistent with the budget strategy principle of focusing on protecting our vital core services.

August 26, 2013

Subject: Agreement for the Digester and Thickener Facilities Upgrade Project

Page 7 of 7

COST SUMMARY/ IMPLICATIONS

1. AMOUNT OF RECOMMENDATION: \$12,017,526

2. COST ELEMENTS OF AGREEMENT:

Project Administration	\$ 553,816
Preliminary Engineering	929,486
Design Development	5,608,560
Support Services During Bidding & Construction	\$2,351,152
Commissioning & Training Services	338,083
Optional Services	2,236,429
TOTAL AGREEMENT AMOUNT	\$12,017,526

3. SOURCE OF FUNDING: 512 – San Jose/Santa-Clara Treatment Plant Capital Fund.

4. FISCAL IMPACT: The consultant agreement has been reviewed and was determined that it will have no significant adverse impact on the General Fund operating budget.

BUDGET REFERENCE

The table below identifies the fund and appropriation proposed to fund the agreement

Fund #	Appn. #	Appn. Name	RC #	Total Appn.	Amt. for Contract	2013-2014 Proposed Capital Budget*	Last Budget Action (Date, Ord. No.)
Remaining Project Costs				\$12,216,196			
Remaining Funding Available				\$12,441,222			
Total Current Funding Available							
512	4127	Digester Rehabilitation	171620	\$12,445,000	\$12,017,526	V-185	06/18/2013 Ord. 29271
Total Funding for Project				\$12,445,000	\$12,017,526		

*The City Council approved the 2013-2014 Capital Budget on June 18, 2013.

CEQA

Statutorily Exempt, File No. PP10-066 (d), CEQA Guidelines Section 15262, Feasibility and Planning Studies.

/s/

KERRIE ROMANOW

Director, Environmental Services Department

For questions, please contact Ashwini Kantak, Assistant Director, Environmental Services Department, at (408) 975-2553.